National Remedy Review Board
Michigan Department of Natural Resources and Environment
Position Paper
Allied Paper Operable Unit Feasibility Study

The Michigan Department of Natural Resources and Environment (DNRE) was invited by the United States Environmental Protection Agency (USEPA), as a Stakeholder, to provide a position paper on the information presented in the Draft Feasibility Study for the Allied Paper Operable Unit located within the Kalamazoo River Superfund Site. This position paper provides a summary of the DNRE's interpretation on the site data based on its time as the lead agency for the Allied Paper Operable Unit. This summary includes descriptions of contaminant distribution and fate at the site (our Conceptual Site Model, or CSM), the criteria that are applicable to determine which areas are subject to remediation, how those criteria should be applied at the site to control risks and, finally, the preferred remedial approach for the Allied Paper Operable Unit based on the options presented in the Draft Feasibility Study (FS).

Conceptual Site Model or CSM

Over the past decade, an extensive Remedial Investigation (RI) at the Allied Paper Operable Unit (OU) of the Kalamazoo River Superfund Site was conducted. The Allied Paper OU has, by far, the most extensive data set from which to make remedial decisions than any other OU at the Kalamazoo River Superfund Site. To meet the primary goals of the RI, a variety of investigations were performed to characterize the physical and chemical aspects of the site. These investigations have resulted in an understanding of the nature and extent of regulated constituents in site media and the processes governing their transport and fate.

Remediation activities at the Allied Paper OU actually began during the RI. The Removal Action in the Bryant Mill Pond and the Interim Response Measure (IRM), which focused on the Bryant historic residual dewatering lagoons (HRDLs) and former residual dewatering lagoons (FRDLs), resulted in consolidation and isolation of a large mass of polychlorinated biphenyl (PCB) impacted waste and sediments. The removal of a large mass of PCB material from the stream bed and floodplains of Portage Creek during the Removal Action resulted in a significant reduction in surface water and fish tissue PCB concentrations. The later IRM work to cap waste materials in the Former Bryant HRDLs and FRDLs has minimized the infiltration of rainwater through the contaminated waste in this area, which has certainly slowed the production of leachate. It is also understood that the sheetpile and groundwater extraction system have resulted in a reduction of contaminant transport to Portage Creek. A considerable body of information is available that is sufficient to assess the present state of the Allied Paper OU, and inform decisions on future remedial actions.

The exposure pathways that still exist include:

Soil/Sediment
The chemicals of concern (COCs) at the Allied Paper OU, which include PCBs, semi-volatile organic carbon (SVOC) compounds, and Target Analyte List (TAL) constituents, are present in the surface and subsurface soils, sediment, and residuals in all areas of

the site. These impacts have been delineated using both chemical confirmation sampling and visual observations of residual material from boring locations. An understanding of the nature of the waste material (residuals), derived from the relatively large number of samples collected in the source areas at the site (i.e., the Former Operational Areas), has justified the use of visual observations to delineate the extent of impacts at the site. The data within the RI provides a basis for assuming that other COCs are similarly distributed with the PCB impact associated with the site.

The data indicate that contaminant concentrations exceed the soil screening criteria (background and unrestricted residential) and other potentially applicable soil criteria (commercial/industrial and ecological) in the Former Operational Areas. Contaminated residuals have also migrated onto the Residential/Commercial Areas adjacent to the Former Operational Areas and the Former Bryant Mill Pond at concentrations that are assumed to exceed the soil screening criteria (background and unrestricted residential) and may exceed other potentially applicable soil criteria (commercial/industrial and ecological) as well. Due to the effectiveness of the Removal Action in the Former Bryant Mill Pond, contaminant concentrations in soil are not expected to exceed the soil screening criteria in this area of the site.

The data indicate that contaminant concentrations exceed the sediment screening criteria (mainly the PCB Method Detection Limit) at the site. Within the Former Bryant Mill Pond the vast majority of sediment sample locations have concentrations below the sediment screening criteria. Sediment samples within the Former Bryant Mill Pond with contaminant concentrations that exceed the sediment screening criteria are located mostly in the vicinity of Seeps G, H, I, and J, or in the upstream portion of the Former Bryant Mill Pond near the sheetpile. Other sediment samples with contaminant concentrations that exceed the sediment screening criteria are located along Portage Creek near the Former Operational Areas (specifically in the vicinity of sheetpile SP-416 to SP-611), and in the Panelyte Marsh. These areas should not be removed from consideration in the FS.

Groundwater

As stated earlier in the RI, given the mass of residual material at the site and the fact that the waste material sits in groundwater, it has been shown that PCBs and other COCs are identified at detectable levels in the groundwater at the site. Once in the groundwater, PCBs and other associated contaminants are being transported the relatively short distance to the regional groundwater discharge feature, Portage Creek.

The current groundwater extraction system is not currently operated to achieve the required goal of keeping groundwater levels to within one foot of the historic groundwater level. However, the extraction system appears to be capturing some contaminants in groundwater. The operation of the current groundwater extraction system, in conjunction with the sealed joint sheetpile, does not eliminate all groundwater flow paths that may transport contaminants to Portage Creek in the areas where this system has been installed (the Bryant HRDLs and FRDLs). Additionally, hydraulic control measures such as sheetpile and a groundwater extraction system do not exist in other areas of the site where waste remains (Monarch HRDLs, Former Type III Landfill, and portions of the Western Disposal area). While great care was taken when installing the existing sheetpile at select areas of the site, it is not an impermeable structure.

Therefore, impacted groundwater is presumed to still be migrating into Portage Creek along stretches of the OU where large volumes of waste materials exist.

During the most recent groundwater sampling, PCBs and other COCs were detected in several of the Groundwater/Surface Water Interface (GSI) monitoring wells located along Portage Creek near the Former Operational Areas, with most of the PCB detections below the GSI screening criteria (for protection of impacts to surface water). The data also indicate that non-PCB contaminant concentrations exceed the screening criteria (mostly GSI and generic drinking water criteria) in all areas of the site where groundwater has been collected. The DNRE will provide a list of appropriate COCs in its forthcoming comment letter to the USEPA on the FS.

The presence of springs on the banks of Portage Creek is characteristic of a groundwater-fed drainage system. The flow nets, head level in the aquifers, and contour maps of the various groundwater units that conduct groundwater, all indicate that Portage Creek is a strong groundwater discharge zone. The presence of significant spring activity is consistent with the hydrogeological conditions and flow and transport of groundwater on this site. This phenomenon represents an important groundwater pathway by which site contaminants are still being transported to Portage Creek.

During the most recent sampling, PCBs were detected in several of the groundwater seep monitoring wells located along Portage Creek near the Former Operational Areas, with PCB detections above the GSI screening criteria in two locations. The data also indicate that non-PCB contaminant concentrations exceed the screening criteria (mostly GSI and generic drinking water criteria) in almost all areas of the site where groundwater seep samples have been collected.

Regarding the adequacy of the groundwater investigation and available data for the Allied Paper OU, it is the DNRE's position that sufficient information exists to allow the USEPA to make an informed remedial decision for the site. All information collected to date supports the main conclusion of the RI that the discharge of Portage Creek into the lower elevation of the Kalamazoo River is having an overwhelming influence on groundwater flow at and emanating from the site. In our view, any remaining uncertainty about groundwater conditions at the Allied Paper OU is not inconsistent with the level of uncertainty we commonly face in addressing similar sites. Our recommendation that sufficient information exists to make a remedial decision is based upon a degree of rigor in site characterization that is comparable to or greater than what is available for remedial decision making at sites where similar threats are being evaluated. The DNRE acknowledges the importance of this question due to the proximity of this disposal unit to a regional drinking water resource. It is for this reason the DNRE recommends that the FS plan for and cost out a long-term monitoring program that monitors groundwater trends over time.

Surface Water

Although temporal trends in PCB concentration cannot be reliably extracted from the 2000-2006 surface water data, average PCB concentrations increase from upstream (0.015 micrograms per liter [µg/L] at Cork Street) to downstream locations (0.031 µg/L at Alcott/Bryant Street) by a factor of two. Thus, the site still appears to be contributing PCBs to Portage Creek surface water. Contaminant concentrations at both the

upstream and downstream sample location exceed the surface water screening criteria (Michigan Human Health/Wildlife Water Quality Criteria).

Fish Tissue
As discussed previously, temporal trends in PCB concentration cannot be reliably extracted from the post-Removal Action fish-tissue data presently available. However, a simple comparison of upstream (Monarch Mill Pond, 11 carp collected in 2001) and site (Former Bryant Mill Pond, 11 carp collected in 2001) can be made (CDM 2002a). For the skin-off filet, resident adult carp, the wet weight mean total PCB concentration was 0.17 milligrams per kilogram (mg/kg) for Monarch Mill Pond and 0.72 mg/kg for the Former Bryant Mill Pond. Mean contaminant concentrations for both the upstream and downstream fish samples exceed the Michigan Department of Community Health criteria of One Meal/Week for Women and Children, yet are below general population no consumption criteria.

Chemicals of Concern/Remedial Action Objectives/Preliminary Remedial Goals

COCs
The FS must consider all relevant COCs for the site, not just focus on PCBs. The RI narrowed its focus on identifying the extent of PCBs due to an understanding that other contaminants were co-located with those PCBs. However, for the purpose of evaluating an FS, all COCs are relevant and must be discussed. For soil and sediment, these include PCBs, SVOCs, and TAL inorganics. The COCs in the groundwater include PCBs and TAL inorganics. As such, consideration of all COCs should be included in the FS, and should be a consideration during development of confirmation sampling and groundwater monitoring programs. The DNRE will provide a list of appropriate COCs in its forthcoming comment letter to the USEPA on the FS.

Remedial Action Objectives (RAOs)
The RAOs identified for the site in the FS are appropriate. The RAOs identified in the Draft FS are provided below.

RAO 1	Mitigate the potential for human and ecological exposure to materials at OU1 containing PCB concentrations that exceed applicable risk-based cleanup criteria.
RAO 2	Mitigate the potential for PCB-containing materials to migrate, via erosion or surface water runoff, into Portage Creek or onto adjacent properties.
RAO 3	Mitigate the potential for groundwater with PCB concentrations exceeding applicable criteria to migrate to Portage Creek or off-site.

Preliminary Remedial Goals (PRG)
The USEPA Technical Memorandum titled "Summarization of Preliminary Remedial Goals Kalamazoo River/Portage Creek OU1 Site WA No. 037-RSBD-059B, Contract EP-S5-06-01" adequately identifies PRGs for PCBs. As stated in the Technical Memorandum (TM), "This TM is focused on PCBs as the driver for evaluating risk. Other potential contaminants of concern have been identified at OU1 and will need to be considered with PCBs for future remedial actions." As such, other PRGs related to SVOCs and TAL inorganics are necessary. Part 201, Environmental Remediation, of

the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), Generic Cleanup Criteria are considered appropriate for non-PCB COCs. The DNRE will provide a list of appropriate COCs in its forthcoming comment letter to the USEPA on the FS.

Criteria Application

The Draft FS fails to consider the current and future land uses as well as the environmentally sensitive location of the Allied Paper OU in determining whether an area poses an actual or potential risk to human health and the environment. Areas that will be restricted to industrial uses should be evaluated with respect to the State's health-based soil criteria for industrial/commercial land use. Areas zoned residential need to be evaluated with respect to the State's health-based soil criteria for residential land use. Areas of the site should also be considered for their ecological value where criteria developed in the Baseline Environmental Risk Assessment would apply, and the sediments at the site should be evaluated with respect to the criteria developed for the human health risk assessment. It is assumed that where soil versus sediment criteria will be applied is dependent on an inundation period, as previously considered for other OUs, but the current Draft FS is not clear on this issue. A reasonably conservative approach would be to apply sediment criteria to the entire 100-year floodplain, as was decided for another OU at the site. The Draft FS currently over utilizes the Industrial Criteria at the site. Aquatic and Terrestrial Criteria from the PRG memo should be considered for environmentally sensitive areas at the site, such as in the creek, floodplain, and areas that may not be capped. A more rigorous application of where certain criteria will apply for the Allied Paper OU is required.

Additionally, the Draft FS assumes that a groundwater remedy will not be implemented. However, groundwater monitoring will be a component of the remedy into the future. As such, during future monitoring activities, the groundwater pathway at the site should be evaluated against the most restrictive criteria, which is application of the GSI Criteria in the vicinity of Portage Creek and consideration of the Drinking Water Criteria as it relates to monitoring for off-site migration. Surface water at the site should also be considered in relation to the State's relevant criteria.

DNRE Preferred FS Elements

Any remedy that is considered protective for the site must contain the following elements to ensure that exposures are controlled, that the remedy is protective in the long term, and allows for implementation of contingent remedies and reuse goals.

Separation of waste from Portage Creek – The FS for the Allied Paper OU must make separation of residuals waste and impacted soils from Portage Creek a priority. The residual material closest to the creek is most likely to be saturated and is most likely to be a source of contamination to the groundwater and creek. By pulling material back from the creek and reconsolidating in other areas of the site, the most direct threat to the groundwater and creek will be addressed. Additionally, a buffer zone between Portage Creek and the disposal area is necessary to protect any landfill infrastructure from the energy of the creek over the long term. This buffer zone is also necessary to allow for

implementation of groundwater contingencies should they be necessary, without the need to damage or reconstruct landfill infrastructure into the future.

Monarch HRDLs – The current location of the Monarch HRDLs, across the creek from the Bryant HRDLs and FRDLs, has created an unstable river channel. As such, removal of the Monarch HRDLs and consolidating it with the main disposal area will provide an opportunity for Portage Creek to have additional area for the release of energy without threatening long-term stability of landfill infrastructure.

Landfill Cap Design – Much of the existing capping of the waste is not in compliance with the relevant portions of Michigan's Part 115, Solid Waste Management, of the NREPA, including cap termination at the sheetpile and patching work completed along the perimeter of the HRDLs. Part 115 is an applicable or relevant and appropriate requirement and should be appropriately applied to the alternatives in the FS. Remedial options must require bringing the cap up to current standards to best assure little to no infiltration of precipitation into the residuals waste and allow for appropriate termination of the cap along the perimeter of the waste.

Outlying Areas – Long-term management of waste in the outlying areas is not practical. Material from the outlying areas should be consolidated where possible to limit the footprint of the waste, and reduce long-term maintenance and monitoring costs.

Sheetpile – A remedy that retains the sheetpile will result in significant long-term costs to the project. These costs would be related to groundwater treatment, management of the creek to limit damage to the landfill infrastructure, additional costs for implementation of potential future groundwater contingencies, and will result in cap termination design that is not compliant with Part 115. An acceptable remedy will therefore eliminate the reliance on the sheetpile and, in turn, the need for continued groundwater collection to control groundwater levels.

Seeps – The seeps represent an ongoing and direct source of PCBs and other contaminants to Portage Creek. The Draft FS fails to consider the seeps and the proposed alternatives do not identify options that can be implemented to address the pathway. An acceptable remedy must recognize this natural process and address the contamination at the seeps.

Bryant Mill Pond – Work conducted as part of the time critical removal action (TCRA) to address contamination of the Bryant Mill Pond was very successful. However, the removal was not completely effective in all areas; for example, in the floodplain near the Former Type III Landfill. Additionally, in the 10 years since implementation of the TCRA, recontamination from the adjacent unaddressed portions of the site remains an issue. An acceptable remedy will address areas of Portage Creek where the TCRA was least successful and where recontamination has occurred.

Consideration of restoration and future development issues should be included during the FS to improve overall efficiency.

Recommendation

Remedial options identified in the FS that address the above concerns include Alternative 2B - Consolidation of Off-site Areas and the Monarch Landfill on HRDLs/FRDLs, Alternative 3 - Offsite Disposal, and Alternative 4 - Full Encapsulation. The Draft FS is currently being reviewed by the DNRE. Provided the above elements are fully addressed and the DNRE's comments are incorporated into a Final FS, the DNRE considers Alternative 2B to be an adequately protective alternative when evaluated in the context of the Comprehensive Environmental Response, Compensation and Liability Act decision making process.

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